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TROLLEY.

APPLICATION FILED FEB. 26, 1904.

2 SHEETS--SHEET 1.

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2 SHEETS—SHEET 2.

Fig. 2.

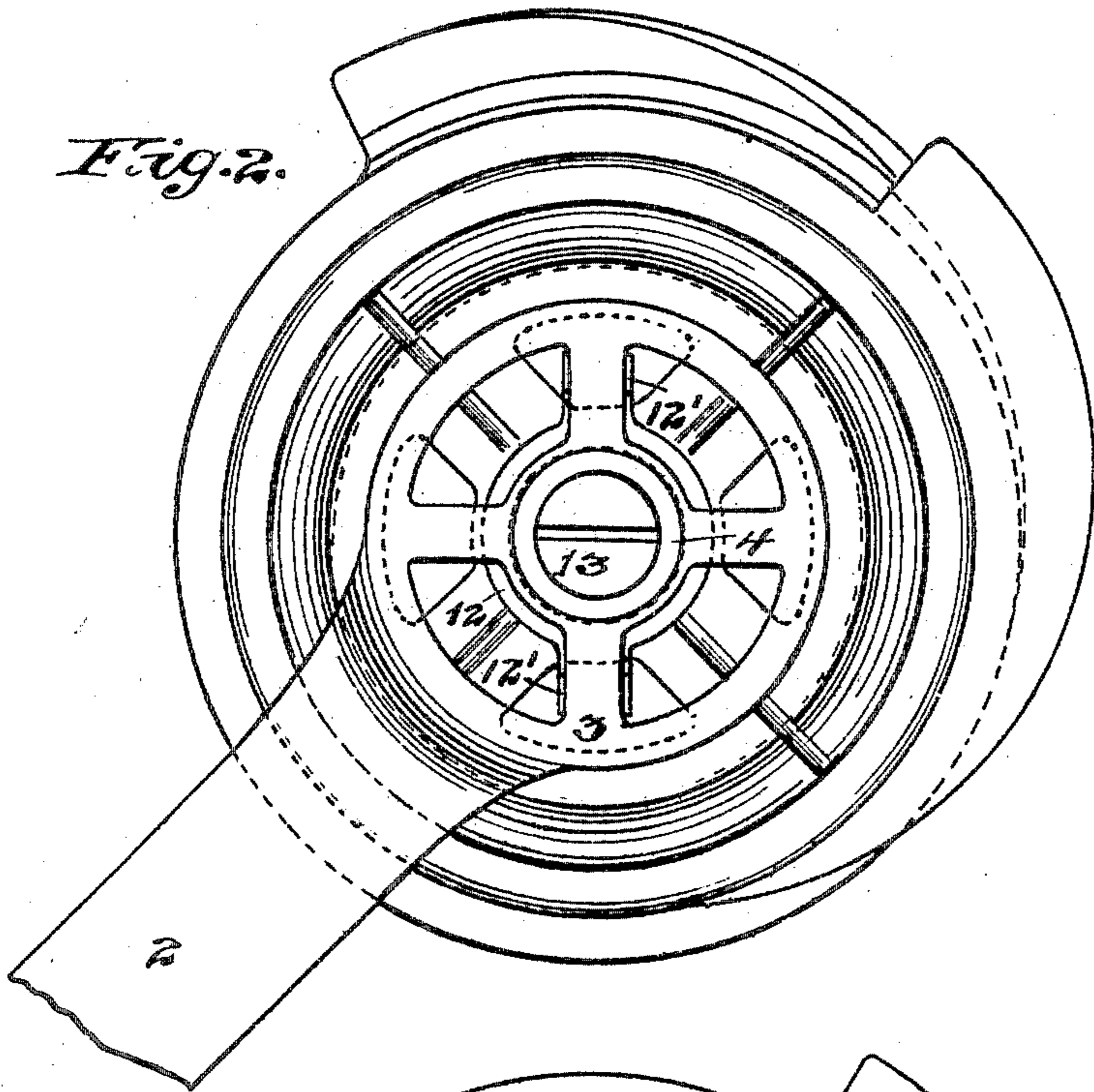
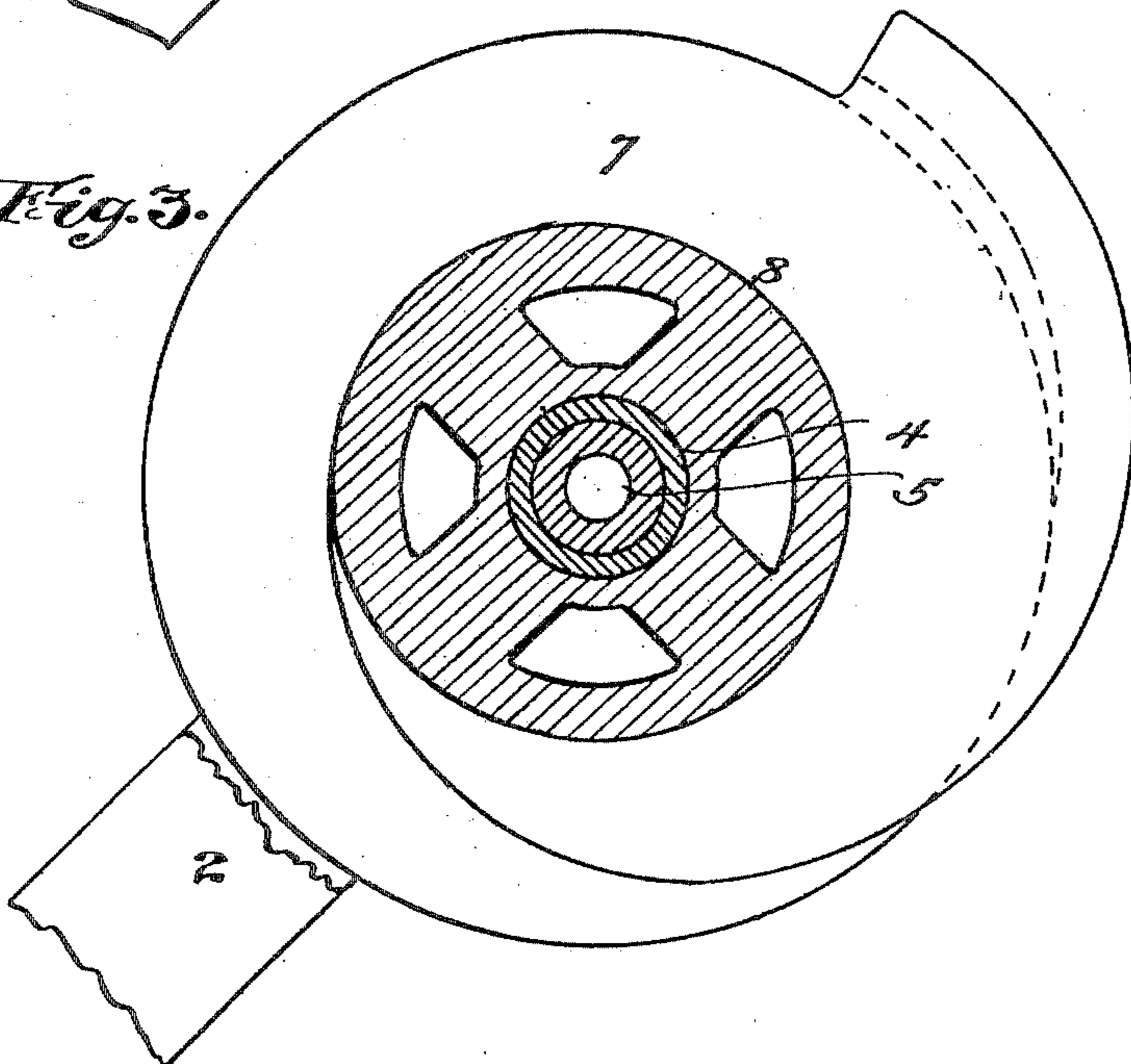


Fig. 3.



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TROLLEY.

No. 797,720.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY B. CLARKE, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Trolleys, of which the following is a specification.

This invention relates to trolleys of that kind commonly used for conveying current from an overhead trolley-wire to a street-car, and comprises a trolley-wheel mounted upon a resilient support and provided with means for catching and restoring the trolley-wheel to the trolley-wire in case it jumps off the wire.

Among the salient objects of the present invention are to provide a construction in which a combination guard-wheel and restoring device is mounted adjacent each side of the trolley-wheel, by means of which the trolley-wheel is restored to its normal position on the trolley-wire if from any cause it has become disengaged therefrom and moved laterally a substantial distance out of register therewith; to provide such combination guard-wheel and restoring device with a spiral restoring-groove which in form combines a logarithmic and helical spiral, the construction being such that the trolley-wire is elevated or the trolley-wheel depressed very gradually during the restoring action, so that the frictional engagement of the wire with the restoring-wheel is ample to effect a certain positive rotation of the restoring-wheel, and therefore a certain restoration of the trolley-wheel and trolley-wire into normal relation with each other; to provide a construction in which the trolley-wheel at all times rests in good electrical contact with the trolley-wire while properly engaged and in which the combination guard-wheel and restoring device is held in good electrical contact during the restoring of the trolley-wheel to the wire; to provide in a construction of the character referred to a complete metallic circuit from the trolley-wheel or from the restoring device to the bearing-arms of the trolley-pole other than through the axle on which the trolley-wheel runs, thus avoiding the necessity of the electric current passing through the thin film of lubricating fluid on the axle, which would tend to destroy its lubricating effect, if not burn it dry altogether; to provide a construction in which the working bearings are practically dust and weather proof and are self-lubricating, and in general to provide an efficient

and durable construction of the character referred to.

To the above ends the invention consists in the matters hereinafter described and more particularly pointed out in the appended claims, and the invention will be readily understood from the following description, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation, partly in section, of a trolley-wheel embodying the invention. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional view on lines 3 3, Fig. 1. Fig. 4 is a fragmentary view showing certain details of construction. Figs. 5 and 6 are detail views of washers used, and Fig. 7 is a view showing a form of spring-washer.

Referring to the drawings, 1 designates the upper end of a trolley-pole, having mounted thereon an irregular-shaped yoke or harp 2, terminating in a pair of flat disk-like arms 3 3, the disk-like portions of which in the present instance are of a wheel-like pattern with spokes 3'. Each of said disk-like arms is provided with a transversely-extending hub or short tubular bearing member 4, arranged in alinement with each other and constituting together a supporting-bearing for an axle 5. Upon said axle 5 between the inner ends of said tubular bearing members 4 4 is revolubly mounted a trolley-wheel 6, and upon the inner end of each tubular bearing member adjacent the opposite sides of said trolley-wheel is revolubly mounted a combination guard-wheel and restoring device 7, formed in one piece, the guard-wheel portion thereof being flared outwardly, so as to extend slightly beyond the disk-like arms, as indicated at 7' and clearly shown in Fig. 1. The juncture between the guard-wheel and restoring portions of the device is of a groove-like construction, said groove taking a spiral course up the cone-shaped surface of the restoring portion until it terminates at the periphery thereof and slightly overhangs the rim or periphery of the trolley-wheel proper, as indicated at 8 8, Fig. 1. The restoring portions of the devices 7 7 on each side of the trolley-wheel 6 are the same, except that they are reversely formed, or rights and lefts. It will thus be seen that if the trolley-wheel from any cause is thrown off the trolley-wire and out of register therewith the wire will be caught by one of the guard-wheels, which will deliver it into the groove 8. The acting guard-wheel and restoring device will be

caused to revolve on the tubular member 4 by reason of its contact with the trolley-wire and the latter by means of the spiral groove 8 carried up the surface of the restoring device and delivered into the groove of the trolley-wheel proper.

An important feature of the present invention and one which contributes to a perfect working and life of the device is a construction which provides a complete metallic circuit from the trolley-wheel or from either of the guard-wheel and restoring portions to the disk-like arms of the yoke and thence to the trolley-pole other than through the axle on which the trolley-wheel runs. This avoids the necessity of the electric current passing through the thin film of lubricating fluid on the exterior of the axle on which the trolley-wheel runs, and therefore prevents a burning of the lubricating fluid. To provide this complete metallic circuit, the following construction is devised: A wearing-washer 9, provided with split lugs or ears 10, slightly enlarged at their ends, is mounted on the inner end of each tubular bearing member 4, slightly separating the trolley-wheel from the restoring device and also increasing the contacting area between the hub 6' of the trolley-wheel and the restoring device and the tubular member 4. Said washer is held in place during the removal or insertion of the trolley-wheel by the insertion of the lugs into corresponding sockets 11 in the ends of the tubular bearing members 4 4. Spring-washers 12 are also provided and mounted upon said tubular bearing members between the disk-like arms and the hub of the guard-wheel. These washers 12 are somewhat oblong and bowed in the middles, the bowed portion resting against the outer end of the guard-wheel hub, while the ends are provided with arms 12', which fit around the spokes of the disk-like arms. The form and construction of said washers are shown clearly in Fig. 7 and their application in Figs. 1 and 2. The pressure of these washers against the guard-wheel and restoring device on each side of the trolley-wheel holds the parts in close elastic contactual relation with each other, and therefore insures a good metallic circuit from the trolley-wheel in each direction through the wearing-washers 9 9, the tubular bearing members 4 4, the hubs of the guard-wheels and restoring devices 7 7, the spring-washers 12 12, and the skeleton disk-like arms 3 3 to the harp and thence to the pole. The washers 12 are arranged in pairs, the two of each pair being arranged crosswise of each other and engaging different spokes of the disk-like arms 3, Fig. 2.

The axle 5 is of a tubular form and is provided at one end with a screw-plug 13, which closes the end of the axle. 14 designates a cotter-pin passing through the tubular member 4, the axle 5, and the screw-plug 13 and

prevents the parts from becoming loose or disengaged after they have once been assembled. Oil-ducts 15 in the middle of the axle 5 permit the oil or lubricating fluid to be drawn from the interior of the axle by the running of the trolley-wheel over the axle. The lubricating fluid is supplied from an up-turned cup member 16, mounted on one end of said axle. Said cup member is normally closed by a disk 17, held against a ring 18, mounted in the mouth of the cup member by a spring 19, which rests upon a transversely-placed pin 20. Opening through said cup member and in register with the chamber in the hollow axle 5 is an aperture 21, through which absorbent material, such as waste, may be supplied to the interior of said axle to receive the oil and retain it until pumped or drawn out through the oil-ducts by the moving of the trolley-wheel thereover. Said aperture 21 is threaded and provided with a screw-plug 22 to keep the same closed when not in use.

While I have herein shown a practical embodiment of the invention, it is susceptible to changes in details of construction and arrangement, and I do not, therefore, limit the invention to the details shown except in so far as they are made the subject-matter of specific claims.

I claim—

1. The combination with a trolley-wheel, of a combined guard-wheel and restoring device rotatably mounted on each side of said trolley-wheel and slightly overhanging the outer edges of the periphery of said trolley-wheel said guard-wheel portion comprising an upwardly and outwardly flared rim which guides the trolley-wire into engagement with the restoring-wheel portion.

2. The combination with a trolley-wheel, of a combined guard-wheel and restoring device rotatably mounted on each side of said trolley-wheel and slightly overhanging the outer edges of the periphery of said trolley-wheel, the restoring portion of each device having a spiral groove from the juncture between its two portions to its overhanging periphery and the guard-wheel portion comprising an upwardly and outwardly flared rim which guides the trolley-wire into engagement with the restoring-wheel portion.

3. In a trolley, the combination of a trolley harp or yoke terminating in a pair of arms, a tubular bearing member rigidly mounted in each of said arms in alinement with each other, an axle mounted in said tubular bearing members, a wheel mounted on said axle between the ends of said tubular bearing members, a combined guard-wheel and restoring device mounted on each tubular bearing member adjacent the opposite sides of said trolley-wheel, and means holding the parts in closely-assembled relation.

4. In a trolley, the combination of a trol-

ley harp or yoke provided with a pair of flat, disk-like arms, a tubular bearing member upon each of said arms and in alinement with each other, an axle mounted in said tubular bearing members, a trolley-wheel mounted on said axle between the ends of the bearing members, a combined guard-wheel and restoring device mounted on each tubular bearing member adjacent the opposite sides of said trolley-wheel, and spring-washers mounted upon said bearing members and holding said revolving parts in elastic contactual relation with each other, substantially as described.

5. In a trolley, the combination of a trolley-harp provided with a pair of arms, a tubular bearing member upon each arm and in alinement with each other, an axle mounted in said tubular bearing members, a trolley-wheel mounted upon said axle between the ends of said bearing members, a guard-wheel and restoring device mounted on each tubular bearing member adjacent opposite sides of said trolley-wheel, a wearing or contactual washer mounted on the end of each of said tubular bearing members between said trolley-wheel and said restoring device, said washers being provided with split ears adapted to fit into sockets in said bearing members to hold said washers in place, and bowed spring washers holding said parts in close contactual relation, substantially as described.

6. In a trolley, the combination of a trolley harp or yoke provided with a pair of sup-

porting-arms, an axle mounted within said supporting-arms, a trolley-wheel revolubly mounted on said axle, a guard-wheel and restoring device mounted upon said axle, one on each side of said trolley-wheel and each having contactual relation with said trolley-wheel, said restoring device having a spiral groove terminating in the periphery thereof which overhangs said trolley-wheel, and spring-washers mounted upon said axle and holding said trolley-wheel and said guard-wheel and restoring device in elastic contactual relation with each other.

7. In a trolley, the combination of a trolley harp or yoke provided with a pair of supporting-arms, an axle mounted within said supporting-arms, a trolley-wheel revolubly mounted on said axle, a pair of combined guard-wheel and restoring devices rotatably mounted adjacent the opposite sides of said trolley-wheel, the guard-wheel portion of each device being outwardly flaring and the restoring portion of each device being reversely flaring and cone-shaped, with a spiral groove upon said cone-shaped surface from the juncture of the two portions to the periphery of the restoring portion which terminates in an overhanging lip overhanging the edge of the trolley-wheel periphery, substantially as described.

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